



## COMPONENT ACCESS AND REMOVAL

This section explains how to adjust, access and remove components in a Drawer Microwave Oven. An attempt has been made to arrange these procedures in such a way as to simulate which components would need to be removed first in order to gain access to other components. When following a component removal procedure, it may be necessary to reference another component removal procedures listed earlier in this section.

**NOTE:** Before continuing, please take note of the **WARNINGS** and **CAUTION** below.

### **WARNING**

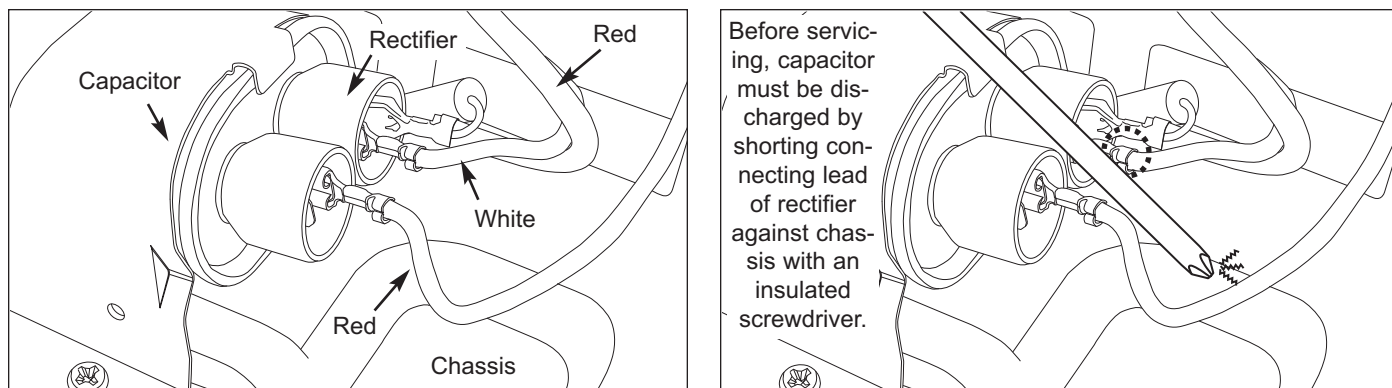
**HIGH VOLTAGE: MICROWAVE OVENS CONTAIN CIRCUITRY CAPABLE OF PRODUCING VERY HIGH VOLTAGE AND CURRENT. CONTACT WITH THE FOLLOWING COMPONENTS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH:**

- TRANSFORMER
  - CAPACITOR
  - RECTIFIER
  - MAGNETRON
  - HIGH VOLTAGE HARNESS
- BEFORE SERVICING MICROWAVE OVEN, THE CAPACITOR MUST BE DISCHARGED BY SHORTING THE CONNECTING LEAD OF THE RECTIFIER AGAINST THE CHASSIS WITH AN INSULATED SCREWDRIVER. FAILURE TO FOLLOW THIS STEP COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH (SEE FIGURE 4-1 ON PAGE 4-3).
- TO AVOID ELECTRIC SHOCK, POWER TO UNIT MUST BE DISCONNECTED WHENEVER ACCESSING AND/OR REMOVING COMPONENTS POWERED BY ELECTRICITY OR COMPONENTS NEAR OTHER ELECTRICAL COMPONENTS.
- BEFORE WIRING:
1. DISCONNECT POWER SUPPLY CORD, OPEN DRAWER, WAIT 60 SECONDS, THEN DISCHARGE THE HIGH VOLTAGE CAPACITOR.
  2. DON'T LET THE WIRE LEADS TOUCH TO THE FOLLOWING PARTS:
    - HIGH VOLTAGE PARTS: MAGNETRON, HIGH VOLTAGE TRANSFORMER, HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY.
    - HOT PARTS: OVEN LAMP, MAGNETRON, HIGH VOLTAGE TRANSFORMER AND OVEN CAVITY.
- TO AVOID EXPOSURE TO MICROWAVES, NEVER OPERATE OR ALLOW DRAWER MICROWAVE TO BE OPERATED WITH THE DRAWER OPEN.
- AFTER PERFORMING ANY REPAIR TO THE DOOR, DRAWER LATCH MECHANISM, OR DRAWER CLOSING FACE, YOU MUST TEST THE INTEGRITY OF THE DRAWER SEAL WITH A MICROWAVE LEAK DETECTOR TO VERIFY THERE ARE NO MICROWAVE LEAKS. (SEE PROCEDURES ON PAGE 4-4)
- IF NECESSARY TO REMOVE MICROWAVE OVEN FROM ITS INSTALLATION, REMEMBER THAT THE UNIT IS HEAVY AND COULD TIP AND/OR FALL, RESULTING IN SERIOUS INJURY.

### **CAUTION**

**Be careful when handling sheet metal parts - Edges may be sharp.**

**NOTE:** When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be performed and drawer interlock operation checked (See Following Page).



**Figure 4-1. Discharge Capacitor**

## PRECAUTIONS FOR USING LEAD-FREE SOLDER

1. **Employing Lead-Free Solder:** The "Main PWB" of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder. Example:

**LF**a  
Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper.

2. **Using Lead-Free Wire Solder:** When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.) As the melting point of lead-free solder is approximately 40°C higher than tin/lead alloy solder, it is recommended that a dedicated bit is used, and that the iron temperature is adjusted accordingly.
3. **Soldering:** As the melting point of lead-free solder (Sn-Ag-Cu) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required. Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.



## MICROWAVE MEASUREMENT PROCEDURE

### 1. Requirements:

- A. *Microwave leakage limit (Power density limit):* The power density of microwave radiation emitted by a microwave oven should not exceed mW/cm<sup>2</sup> at any point 5cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm<sup>2</sup> at any point 5cm or more from the external surface of the oven.
- B. *Safety interlock switches:* Primary interlock relay switch shall prevent microwave radiation emission in excess of the requirement as above mentioned. Secondary interlock relay and door sensing switch shall prevent microwave radiation emission in excess of 5 mW/cm<sup>2</sup> at any point 5cm or more from the external surface of the oven.

### 2. Preparation for testing: Before beginning the actual measurement of leakage, proceed as follows:

- A. Make sure that the actual instrument is operating normally as specified in its instruction booklet.

#### NOTES:

- Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 2 CFR 030.0(c)(3)(i), must be used for testing.
  - Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 800 and NARDA 8200.
- B. Place the load of 275±5 ml (9.8 oz) of tap water initially at 20±5OC (68OF) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically non conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
  - C. Set the cooking control on Full Power Cooking Mode.
  - D. Close the drawer and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.
- ### 3. Leakage test: Closed-drawer leakage test (microwave measurement):
- A. Grasp the probe of the survey instrument and hold it perpendicular to the gap between the drawer and the body of the oven.
  - B. Move the probe slowly, not faster than in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
  - C. Check for leakage at the drawer screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around the drawer, pull the drawer away from the front of the oven as far as is permitted by the closed latch assembly.
  - D. Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4mW/cm<sup>2</sup>, and that the primary interlock switch/secondary interlock relay does turn the oven OFF before any door movement.

## BEFORE OPERATING OVEN AFTER SERVICE

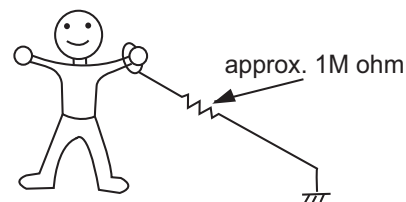
- 1. Disconnect the power supply cord.
- 2. Make sure that a definite "click" can be heard when the microwave oven drawer is unlatched. (Hold the drawer in a closed position with one hand, then pull the drawer open, this causes the latch leads to rise, it is then possible to hear a "click" as the drawer switches operate.)
- 3. Visually check the drawer and cavity face plate for damage (dents, cracks, signs of arcing etc.).  
Do not operate the oven if any of the following conditions exist:
  - Drawer does not close firmly.
  - Drawer latch hook is damaged.
  - The drawer gasket or seal is damaged.
  - The drawer is bent or warped.
  - There are defective parts in the drawer interlock system.
  - There are defective parts in the microwave generating and transmission assembly.
  - There is visible damage to the oven.Do not operate the oven: Without the RF gasket (Magnetron); if the wave guide or oven cavity are not intact; if the drawer is not closed.

## TOUCH CONTROL PANEL SERVICING

1. **Precautions for Handling Electronic Components:** This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit.

*In Order to Protect The CMOS LSI:* When storing and transporting, thoroughly wrap them in aluminum foil. Also wrap all PW boards containing them in aluminum foil. When soldering, ground the technician as shown in the illustration to the right and use grounded soldering iron and work table.

2. **Servicing of Touch Control Panel:** We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.



A. *Servicing the touch control panel with power supply of the oven, therefore, before checking the performance of the touch control panel you must:*

### **⚠ WARNING**

**THE HIGH VOLTAGE TRANSFORMER OF MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD.**

- Disconnect the power supply cord, and then remove the outer case.
  - Open the door and block it open.
  - Discharge high voltage capacitor. (See Figure 4-1 on page 4-3 of this section)
  - Disconnect the leads to the primary of the power transformer.
  - Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
  - Re-connect the power supply cord.
- B. *After checking the performance of the touch control panel:*
- Disconnect the power supply cord.
  - Open the door and block it open.
  - Re-connect the leads to the primary of the power transformer.
  - Re-install the outer case (cabinet).
  - Re-connect the power supply cord after the outer case is installed.
  - Run the oven and check all functions.
- C. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all controls (sensor-related ones included) of touch control panel while keeping it connected to the oven.
- D. On some models, the power supply cord between touch control panel and oven proper is long enough that they may be separated from each other. For those models, it is possible to check and repair the controls of touch control panel while keeping it apart from oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which activates an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.
2. **Servicing Touch Control Panel with Power Supply from an External Power Source:** Disconnect touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which activates an operational state that is equivalent to the oven door being closed. Connect an external power source to power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel. It is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).
  3. **Servicing Tools:** Tools required to service the touch control panel assembly.
    - Soldering iron: 30W (It is recommended to use a soldering iron with a grounding terminal.)
    - Oscilloscope: Single beam, frequency range: DC-0MHz type or more advanced model.
    - Others: Hand tools

## 4. Other Precautions:

- Before turning on the power source of the control unit, remove the aluminum foil applied for preventing static electricity.
- Connect the connectors of the key unit to the control unit being sure that the lead wires are not twisted.
- After aluminum foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- Be sure to use specified components where high precision is required.

## ⚠ WARNING

**FOLLOW ALL SAFETY PRECAUTIONS AS STATED AT THE BEGINNING OF THIS SECTION BEFORE PROCEEDING!**

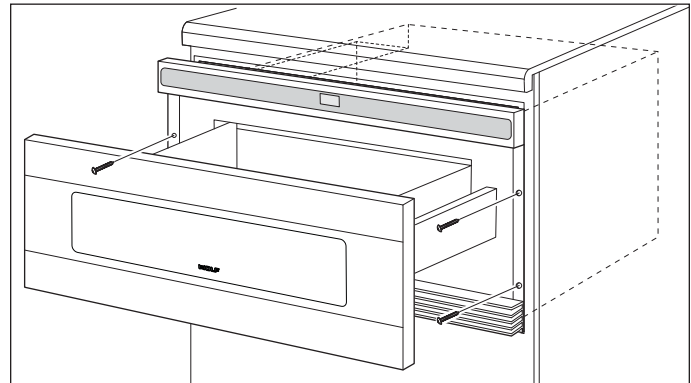
## DRAWER MICROWAVE DISASSEMBLY

1. Open the drawer and extract the four mounting screws holding the unit on to the wall or cabinet opening. (See Figure 4-2).
2. Close the drawer, then carefully pull the unit out from the opening and unplug the power supply cord. Place the unit on a sturdy work surface.
3. Extract four mounting screws (two on each side) from the left and right side angles to remove the louver vent from the unit (See Figure 4-3). Place vent off to the side, on a flat protected surface.
4. Remove the top cover. (See Figure 4-3).
5. Remove the air cover from the back of the unit, both right and left side angles, then both side cabinet panels (See Figure 4-3).
6. Remove the exhaust duct. Disconnect the ground wire terminal from the grounding peg on the back plate. Then, remove back plate (See Figure 4-3).

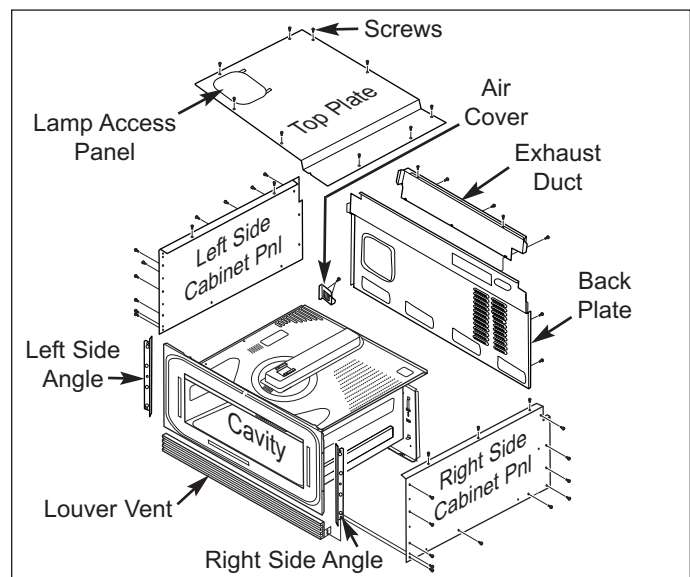
**NOTE:** You now have access to various components for the drawer.

7. To remove the control panel frame assembly from the top of the drawer, extract five mounting screws holding the control panel frame to the control panel angle in the back of the drawer (See Figure 4-4).
8. Unsnap the top control board assembly away from the control panel frame and unplug all wires. The control board assembly is now free.
9. If the control board is being replaced, transfer connectors one at a time to the new control board, to ensure proper connection .

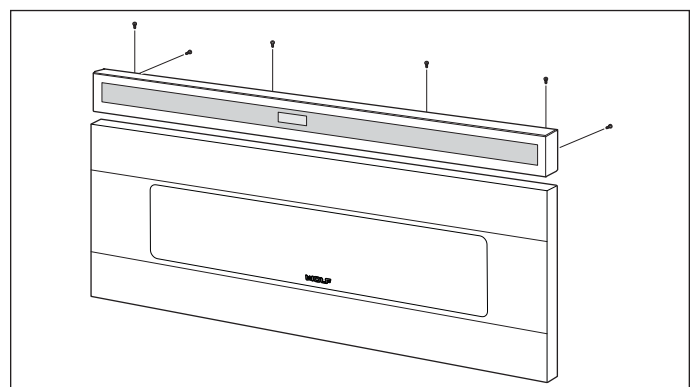
**NOTE:** At this point, you will have access to all parts of the drawer microwave.



**Figure 4-2. Installation Mounting Screw Removal**



**Figure 4-3. Drawer Microwave Exploded View**



**Figure 4-4. Touch Control Panel Removal**